RESPONSE TO OFFICE ACTION

A. Status of the Claims

Claims 1-17 were pending at the time of the Action. Claims 1, 4, and 16-17 are currently amended. Support for these amendments can be found in Examples 3 and 4, and Table 4. Claims 9-15 were withdrawn from consideration.

B. Rejections Under 35 U.S.C. § 112, Second Paragraph

Claim 4 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for depending upon itself. Applicant has amended claim 4 to depend from claim 2.

In view of the foregoing, withdrawal of the rejection is respectfully requested.

C. Rejection Under 35 U.S.C. §103(a)

Claims 1-8, 16 and 17 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,140,555, issued to Reichert *et al.* ("Reichert") in view of U.S. Patent 5,477,000, issued to Saxena *et al.* ("Saxena"). Specifically, the Action asserts that Reichert teaches isolating nodal section from corn seedlings and culturing nodal sections on induction media to produce embryogenic callus suitable for transformation. The Action admits that Reichert does not teach germinating mature corn seed in tissue culture media containing an effective amount of auxin and an effective amount of cytokinin to produce a growing seeding containing a nodal section. However, the Action asserts that Saxena teaches germination of mature seed in tissue culture media. Thus, the Action finds it would be *prima facie* obvious to one of skill in the art in the absence of contrary evidence. Applicants respectfully traverse.

Applicants note that claims 1, 16, and 17 have been amended to recite "a nodal section capable of producing callus." Accordingly, these claims, as amended, provide tissue culture media containing an effective amount of an auxin and an effective amount of a cytokinin to

produce a growing seedling containing a nodal section capable of producing callus suitable for transformation. The cited references do not teach or suggest this claimed element.

The Action relied on the Abstract and column 7, lines 7-35 and 65-66 of Saxena to assert that the reference teaches germination of mature seed in tissue culture media. However, these portions in Saxena relate to tissue culture media to produce multiple shootlets from a single seed. *See* columns 5, 6, figures 1, 2, flow chart 2 in column 5, and Examples 1-4 and other Examples. These shootlets include differentiated cells. These are not callus, which is a mass of undifferentiated cells.

In particular, Saxena in Column 5, lines 3-11, asserts the following:

> The process according to this invention which provides direct differentiation from the cultured seed...[t]he high frequency of direct morphogenesis facilitates mutant selection....

Additionally, flow chart 2 in column 5 relates to directly producing multiple regenerants from seeds, figures 1 and 2 illustrate multiple shootlet production directly from seeds, and columns 5 and 6 further describe direct multiple shootlet production from seeds. Accordingly, the tissue culture process of Saxena is a direct embryogenesis that produces embryos resulting in multiple shoots. In contrast, the tissue culture process of the invention is an indirect embryogenesis or otherwise callogenesis that goes through a callus phase.

Furthermore, Saxena in Column 6, lines 23-27, asserts the following:

> [T]his invention is capable of providing a plurality of viable plant regenerants from a single intact plant seed. Such process totally avoids the step of developing explant material which in the past was subsequently cultured...

Accordingly, Saxena is directed to one-step regeneration of multiple shootlets from a seed that totally avoids explant preparation for subsequent culture. In contrast, the invention in

the present application is directed to preparing a callus producing nodal explant for subsequent culture in a media containing auxin and cytokinin.

Additionally, the flow chart 1 in the background section of Saxena relates to a general principle of raising explants for callus. *See* column 3, flow chart 1. Underneath this flow chart, Saxena notes that success in inducing regeneration depends upon the choice of explant and nutritional and physical milieus of explant culture, and thus requires a great deal of research to optimize the physiological conditions of source seedlings, to select explants and phytohormones, and to culture of explants in tissue culture media. Applicants further note that there is no basis for one of skill in the art to believe that Saxena's tissue culture conditions and media concentrations, which were developed for dicotyledonous plants, could even be applied in monocotyledonous plants such as corn. *See* Columns 9-12, Examples 1-4 and Other Examples of Saxena. Monocotyledonous plants are highly diverged from dicotyledonous plants and it is well known that these differences result in different tissue culture responsiveness. Accordingly, a person skilled in the art would not have had any expectation of success for use of corn explants to produce transformable callus based on Saxena's discussion of general principles. In contrast, the present application provides tissue culture media conditions for raising corn nodal explant source seedlings, by providing effective concentrations of auxin and cytokinin in tissue culture media, in order to physiologically prepare the nodal explants to induce a transformable callus.

As admitted in the Action, Reichert does not teach raising corn seedlings in tissue culture media containing effective concentrations of auxin and cytokinin to produce a nodal explant, and thus Reichert does not cure the defects in Saxena. The cited combination of references therefore fails to teach, either explicitly or inherently, all the features of the claimed invention.

In sum, all elements required to establish a *prima facie* case of obviousness of claim 1 are lacking. As such, the rejection is believed moot and withdrawal of the rejection is thus respectfully requested.

D. Conclusion

In view of the foregoing, Applicants submit that the claims are allowable and respectfully request that the application be passed to issue.

The Examiner is invited to contact the undersigned attorney at (214) 259-0931 with any questions, comments or suggestions that may expedite the prosecution of the above-referenced patent application.

Respectfully submitted,

/Robert E. Hanson/

Robert E. Hanson
Reg. No. 42,628
Attorney for Applicants

Sonnenschein Nath & Rosenthal L.L.P.
1717 Main Street, Suite 3400
Dallas, Texas 75201
214.259.0931 (telephone)
214.259.0910 (fax)

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